

POWER PLAY

Energy management, energy efficiency and energy reduction

The energy crisis in South Africa shows no signs of abating. Loadshedding, aging infrastructure, theft, and corruption, have made guaranteeing a stable energy supply all but impossible.

To add insult to injury, significant power price increases have already been agreed for 2022, and more are on the way. It is crucial for retailers and wholesalers to look at energy efficient equipment and alternative power sources to minimise disruption and damage to their business. In addition to this ...

“More stringent energy efficiency targets were set at the November 2021 COP26 conference, as the increasing toll of climate change, emissions, and energy consumption becomes ever more evident.”

In light of this, understanding the current energy landscape in South Africa is vital for forward-looking businesses who want to remain ahead of the game.



Image courtesy of Markus Distelrath, Pexels

Building energy management

In an article published in early 2021 titled *E4 Country Profile: Energy Efficiency in South Africa*, the International Energy Agency (IEA) noted ...

“South Africa is one of the most energy intensive economies, at 0.179 ktoe (Kiloton of Oil Equivalent) per unit GDP compared with [a] world average of 0.111.”

The article goes on to highlight the fact that increased energy savings and efficiency could be achieved in the buildings sector by “strengthening energy management systems and standards for appliances, especially for cooling.”

Cooling, heating, ventilation, and lights are energy consumers that are often overshadowed by bakeries and refrigeration. These big energy users account for the lion’s share of a store’s energy consumption and therefore tend to be the areas that we focus on. But there is so much more that stores can do.





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Trust the Experience



Image courtesy of Luca Nardone Pexels

Energy efficient lighting is not new, and neither is smart lighting, however, as a report titled *Energy Efficient Lighting on sustainable.org* reminds us: “The replacement of lights with highly energy efficient [alternatives] is one of the simplest and most cost-effective measures to reduce electricity consumption and related greenhouse gas emissions.”

“The replacement of incandescent light bulbs with CFL or LED lights reduces the electricity consumption by around 80% to 90%.”

Replacing your existing lights with LEDs is still the easiest way of achieving energy efficient lighting, but you could also consider a lighting

control system that uses motion and lux (unit of illuminance) level sensors in areas that receive little or intermittent traffic.

Heating, ventilation, and air conditioning. While the energy efficiency of your HVAC system depends on its age, operation, and what sort of system it is, research suggests that correct maintenance has a significant impact on performance.

Clean filters and clean heat exchanger surfaces can affect the energy efficiency of any system. Three steps to consider when looking to optimise your HVAC system are ...

- ensuring that the controls are set with a wide enough band of temperature separating the cooling and heating functions

- including outdoor air temperature scheduling to influence supply air and chilled water temperature
- if space allows, incorporating an economy cycle operation to air handling units.

According to Solo Aircon and Refrigeration, retailers and wholesalers should ensure ...

“... their service provider is well qualified to provide in-depth knowledge and advice regarding the most efficient option for their location and operation.

Engaging an expert in the field is the most sensible way to make sure you invest in a reliable system.”





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Annual saving	R782 901	R1 858 903	R4 937 700



Integrated energy management

Ensuring your building, equipment, and processes are as energy efficient as possible is one thing, but ensuring they stay that way is another. Energy monitoring and management allows stores to achieve these goals.

Energy monitoring and management solutions have come a long way. The developments in the technology and hardware used to monitor systems, appliances, and equipment has become so sophisticated and sensitive, and are so easy to use, that not having an integrated management system makes no business sense.

As Daniel de Beer at Emerson Process Management South Africa often reiterates ...

“ Without proper maintenance and monitoring, even the most advanced systems can become less efficient over time. This drop can be miniscule at first, but even a small increase in energy usage can cause costs to rise significantly over time. ”

The other benefit to monitoring your systems and processes closely is that when you do notice a change, you can often quickly and easily identify the problem and rectify it before it becomes a big, costly exercise.

Knowing what you pay for electricity and how much energy you use, and where you use it, goes a long way to identifying areas of possible improvement. It also ensures that if you do invest



in upgrading to more energy efficient systems and processes, you can measure your ROI and quantify your cost savings. If you aren't seeing the savings you expect, having documented data is important in terms of how you can remedy the issue.

Energy efficient equipment

From refrigeration units to bakery equipment, display units and cold rooms, the pace of product development has resulted in a host of innovative energy efficient solutions.

Whether you are looking for a full turnkey offering, a slow and steady revamp, a simple retrofit, or you just want to change out the refrigerant coolants you're using for a natural gas, there are a number of accredited and acknowledged industry experts available to discuss and implement the

most effective solutions for your store. Colcab, ROCS Africa, Insulated Structures, Concord Refrigeration, SCM Ref Africa, Just Refrigeration, and Danfoss are all committed to providing energy efficient products and solutions backed by years of experience, a nuanced understanding of South African conditions, and a whole lot of targeted research and development.



Refrigeration display cases

Walking through the refrigerated aisles of several of South Africa's leading supermarket chains, the effect of 'close the case' is obvious. Shoppers no longer need their own cold weather gear to peruse the frozen foods department, and smart glass or acrylic doors and sliders are very much



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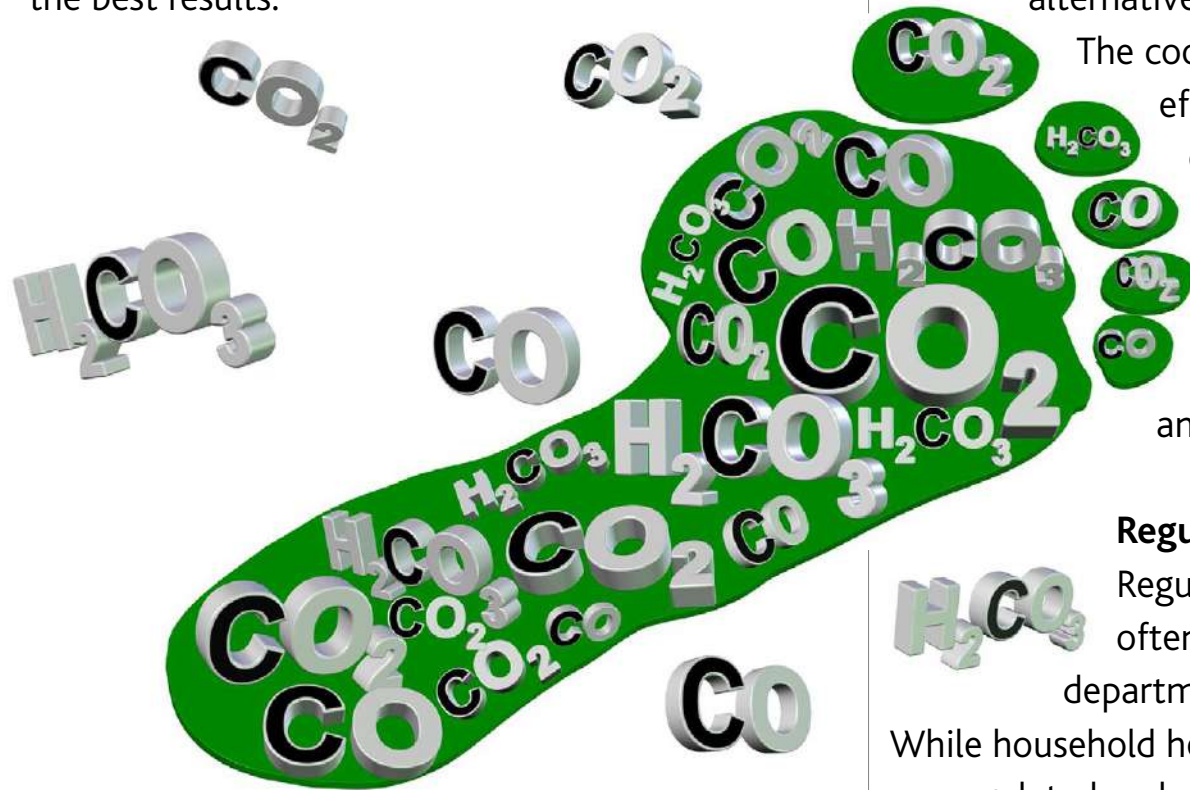
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in evidence. This is because the energy savings achieved alongside the improved shelf life of chilled or frozen produce more than makes up for the cost of adding these closures. Glacier doors has long been a leader in this industry and offers a wealth of knowledge and experience to help stores achieve the best results.



Staycold International have been acknowledged and included in the London-based Environmental Investigation Agency (EIA) publication: The Pathway to Net-Zero Cooling Product List thanks to their HD1140-HC cooler, which uses a Hydrocarbon refrigerant (R290) – a net-zero compatible alternative to HFC-based systems.

The cooler also features high energy efficient fans, a Danfoss digital energy management device, low e-glass doors, and ECOMate® Insulation foam, all of which further assist with reducing its carbon footprint and reducing HFCs.

Regulation in the energy sector

Regulation in South Africa is often complex, overseen by several departments, and poorly enforced.

While household heating and refrigeration units are regulated and receive an A, B, C, or D energy efficiency rating, industrial or commercial units do not.

Greenwashing – conveying a false impression or providing misleading or unsubstantiated information about how a company’s products are more environmentally sound – is a real problem globally and in many industries, and South Africa is

no exception. Claims need to be backed up by proven facts and empirical evidence. When you are buying new equipment, retrofitting your system, or simply maintaining your existing units properly, you need guarantees that the product or service you are using is a legitimate one that delivers the environmental outcome you require.

Staycold International Managing Director Lena le Roux says ...

“Supermarkets and retailers should be encouraged to hold their supply base accountable for supplying them with energy smart products. They should also demand that marketing statements are backed up by facts and not only flashy marketing material. “This is the only way in which we can create an educated chain, with the benefits of saving then effectively flowing from source to the end consumer. From store manager to the shopper, everyone can then play their part in the drive for Net-Zero emissions by 2050.”

Net zero carbon emissions

Race to Zero is a United Nations Framework Convention on Climate Change (UNFCCC) campaign that is made up of a coalition of net zero initiatives, representing 1 049 cities, 67 regions, 120 countries, 441 big investors, 5 235 businesses, and 1 039 institutions of higher education. It is the largest ever alliance committed to achieving net zero carbon emissions by 2050 at the latest, with the goal of net-zero global greenhouse gas emissions being to limit global warming to 1.5 °C.



Source: Theolivetreeproject.com



STAYCOLD coolers offer 33% energy savings

Staycold International, a South African manufacturer of self-contained commercial fridges and freezers, offer supermarket and restaurant owners energy efficient units to save on their monthly electricity bills. This goes a long way in easing Eskom's proposed double digit tariff increase, effective the first half of 2022, as energy costs in a supermarket form a significant contribution to the overall running costs of the business.

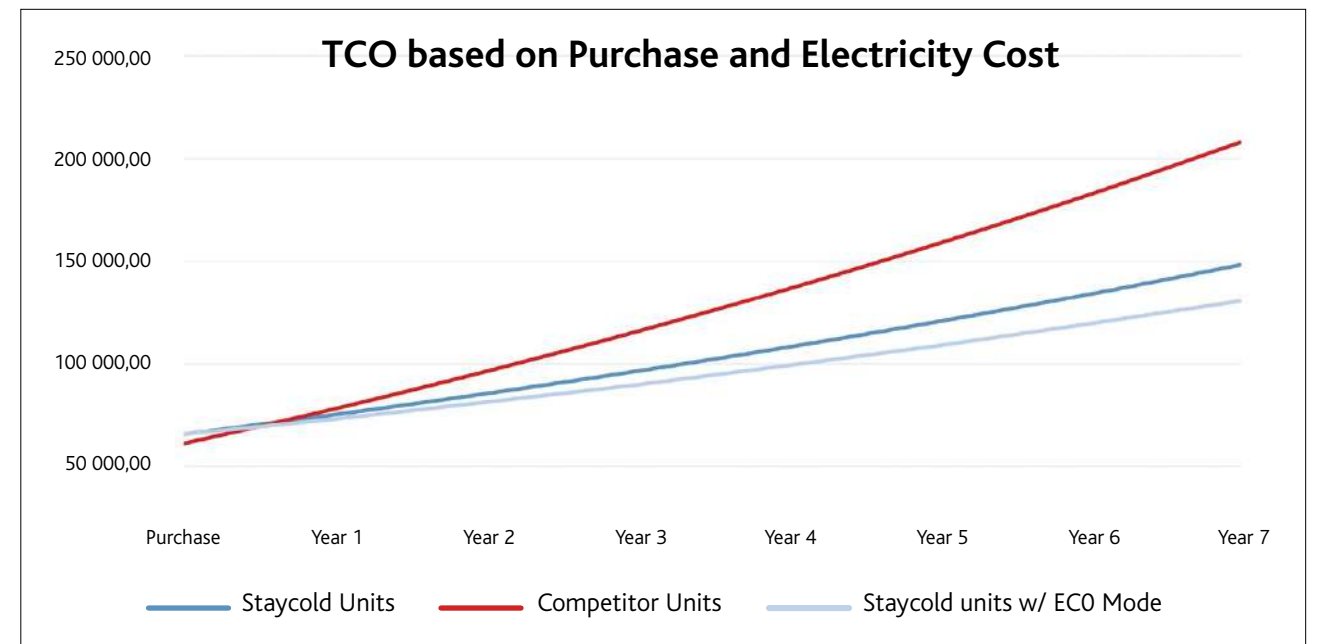
Staycold units have been found to use over 33% less electricity than other brands in a recent energy test at an operational restaurant business in Johannesburg. With most supermarkets having multiple refrigeration units, these savings can often amount to thousands of Rands per month and tens of thousands of Rands per annum.

The reasons why these local units are more energy efficient, is that each Staycold model utilise many, or all of the following technologies and designs: Hydrocarbon refrigerants, high energy fan motors, digital energy management device (EMD) and Low Emissivity glass doors. Operators and owners should thus look for these amongst other things, when comparing product specifications to fully take advantage of efficiency gains.

The cold drink isles in supermarkets where the glass door beverage coolers are often deployed, as well as the underbars in the deli used to prepare the food, are areas that require daily electricity and where Staycold offer these units that could help with monthly savings.

Looking at Staycold's leading cooler, their HD1140-HC, which has a consumption figure of 3.18 kWh/24hr which equates to a daily cost of R7 per day. As of the proposed 1st April 2022 Eskom tariff increase, that same cooler will cost just under R8 per day. Other brands have been seen to use closer to 10kWh/24hrs, so the post hike running costs of these units would be more than R20 per day. So its seen that the Staycold HD1140-HC could save supermarkets R360 per month, or more than R4 000 per year. With a few supermarket outlets, this could equate to hundreds of thousands of Rands that could be recorded as a profit, rather than being paid out as an expense.

Staycold has been manufacturing self-contained commercial fridges and freezers from their factory in Parys, in South Africa for 40 years. They were also acknowledged last year and included in the London-based Environmental Investigation Agency (EIA) publication: The Pathway to Net-Zero Cooling Product List. The product list has been designed to support and accelerate the race to zero emissions by 2050 and to demonstrate the feasibility of urgent action.



“With the electricity costs in South Africa going up year on year, our market will no doubt be calculating the total cost of ownership of their equipment over their lifespan. By choosing a Staycold, companies are ensuring that they not only get a great quality, reliable, powerful and durable product, but also a product that over time will reduce their energy costs by a significant amount while at the same time being better for the environment as a whole.”

Lena le Roux, Staycold's Managing Director

For more information on this case study or Staycold's coolers and freezers, contact them on ...

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Alternative energy sources

In a sun-rich country like South Africa, investing in solar energy as an alternative energy source makes a lot of practical sense, but up until recently the sheer cost of such an exercise has been prohibitive for all but the biggest chains. The savings are undeniable, but the capital layout has been an obstacle.

One of the biggest challenges is the batteries – traditionally the technology has been lacking and the expense prohibitive. Massive battery banks were massively expensive, used a fair amount of space, and needed replacing more often than was feasible.

Over the last few years battery technology has been catching up with demand, resulting in better

quality batteries that hold more energy, last longer, and can withstand the particular power challenges that go hand-in-hand with South Africa's unpredictable load shedding schedule.

With several companies providing bespoke solar conversion solutions, whether you want to run just your basic critical load including lights, points of sale, and ventilation, for example, or if you want to set your entire store up to run on solar power, the options are there.

It is important to remember that for a solar setup to work, you need access to a flat surface that can support the number of solar panels you need, and these panels will need regular maintenance and upkeep, such as cleaning and possibly repair work.

The deciding factor will be the batteries – what sort of batteries to use, how much power they provide and for how long, and how long are they guaranteed for? The constant up and down and associated power surges caused by load shedding can

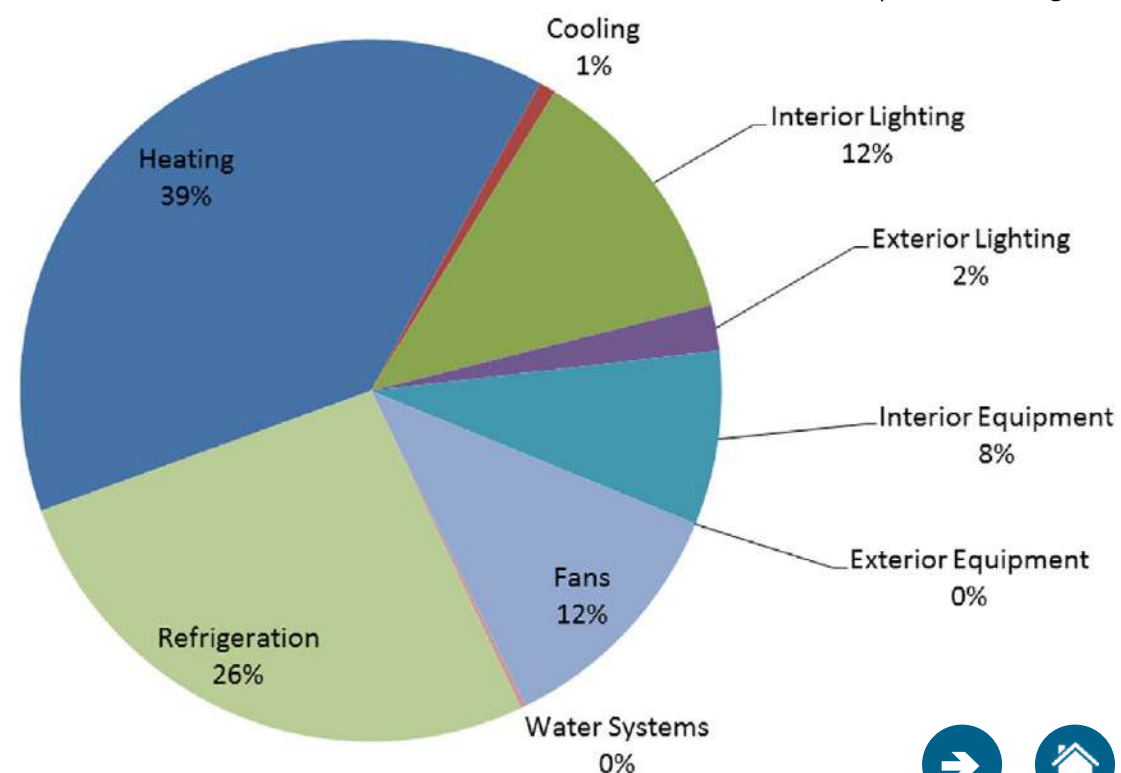
significantly reduce a battery's lifespan, so make sure to ask these questions before you commit.

If solar is not an option due to your location or physical obstacles such as an incompatible roof space or no space in general, then an Uninterrupted Power Supply (UPS) is your solution. PowerMode provides a customisable and scalable UPS solution using high quality lithium-ion batteries. The benefit of a UPS system is that the changeover from grid power to battery back-up is instantaneous. You can use your UPS system to cover the gap between grid power going down and a generator kicking in (short run), or you can use it to run your specified critical load for the entirety of load shedding (long run), making this a very flexible option.

Lithium-ion battery chemistry has come a long way over the last five years or so and demand

Supermarket – End use

Source: <https://www.nrcan.gc.ca/>





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Source:
www.powermode.co.za



This long-run Uninterrupted Power Supply visual from PowerMode shows the workings of the battery pack. Retailers are advised to check the guarantees on any UPS system before making a purchasing decision.

is high, bringing the cost more in line with what is deemed acceptable by store owners and managers. They can also be considered a more environmentally friendly option than lead acid batteries and generators, so although not a 'green' option, these batteries do use less fuel and cause fewer emissions.

High quality new generation lithium-ion batteries don't need to be drained completely before being recharged, so operating according to a load shedding cycle does not affect the lifespan of these

Surge protection technology added to a UPS unit is a valuable add on when dealing with expensive equipment as it can be cheaper to replace the UPS than the equipment itself, and with our aging energy infrastructure the likelihood of power surges caused by load shedding is increasing. Another benefit of using a lithium-ion battery-supported UPS solution is that you can build up your battery banks. For instance, a store may decide to start small with 5kva capacity to run its POS systems, lights, security, and their network, and ultimately

batteries. PowerMode's Q-On I-Series is a high-quality long run UPS with a seven-to-10-year guarantee and the Q-On ionbank is a lithium-ion battery pack with a sophisticated battery management system. Together this solution can be considered a 'green' energy option as the lithium-ion batteries are recyclable, chemically stable, and non-toxic. According to PowerMode, they charge up to 90% more efficiently than lead acid batteries and offer a significantly longer lifespan.

build up to 45kva which could run an entire mega store with ease. The good news is that in some cases it is possible to retrofit or drop a lithium-ion battery solution into an existing lead acid system, although this is not always the case.

One caveat is that the quality of lithium-ion batteries can vary quite a bit. Older batteries can be revamped and sold as new, but these won't include recent developments such as the sophisticated battery management systems and aluminium casings that make newer batteries more reliable, efficient, and longer lasting. It is also true that batteries will need to be recharged by grid power, and this can be costly if done during peak charge times. On the other hand, a generator can keep running as long as your fuel stores hold out. Emissions and fuel costs aside, this is still a reliable and predictable alternative power supply.





Up to 40% energy saving with our Close the Case Glass Doors

Ways to save

With energy costs rising and food retailers looking to improve the shopping environment for customers, Insulated Structures has developed an effective solution to reduce the cost of in-store refrigeration while enhancing the customer experience.

Insulated Structures doors are easy to retrofit on in-store cabinets to reduce the energy required to keep chilled foods at the correct temperature.

Meanwhile, customers are able to clearly see and access the products on offer. Reduced energy requirements means smaller refrigeration plant selection for new stores. These savings will offset the cost of the doors. Up to 40% reduction in refrigeration requirement has been achieved.

Benefits

- Reduced energy consumption
- Extended product shelf life
- Double glazed argon filled void for Better insulation
- Optimal product temperature
- Glass doors have optional mullion lights
- Handles included
- Up to 40% energy saving
- Solution for new cabinets or retro fitted on existing cabinets
- Doors are spring loaded
- Less cold air spillage - warmer aisles
- Proudly South African

Aspects

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The future of energy in South Africa

Eskom has admitted that the sheer scope of repair, renovation, and critical maintenance on their existing power stations was badly underestimated. They are also suffering a lack of skilled workers in

key positions, and there is even talk of sabotage. Added to this the country's infrastructure is under immense strain, and has already started to fail, leading to some areas being without power for hours every day or days at a time. If and when businesses are able to supply excess energy to the grid thanks to solar installations, this will certainly ease some of the burden on the state utility – but that process is proving to be agonisingly slow.

In the meantime, time of use charging that sees stores running on battery power during peak cost hours and charging those batteries during lower cost hours is saving money, but also negatively affecting those batteries. Generators are reliable, but the cost of fuel is rising, and generator emissions are controversial to say the least.

Where it is an option, stores that can afford to are turning to cleaner energy solutions, reducing harmful emissions, and investing in as much energy efficient technology as they can. As the price of electricity rises, so saving on energy consumption becomes an essential business move, as well as an environmentally friendly one. Now is the time to do it.



Ann Baker-Keulemans, a highly experienced business and consumer journalist, is published in numerous print and online platforms, writing on topics related to business, lifestyle, and health, with extensive knowledge on the SA retail and wholesale landscape. She holds a Bachelor of Arts degree in English Literature (British and Commonwealth) and Media Studies and is a member of the Golden Key Honour Society. ann@wilkinsross.co.za
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CASE CLOSED

Energy Saving Solutions

Glacier Door Systems has introduced the Air Shield ('Close the Case') Glass Door retrofit solution for refrigerated supermarket display cases, as well as the Eco Leaf Replacement Glass Door for existing glass door freezer rooms and glass door freezer display cabinets. Both solutions guarantee energy-savings in an ever-increasing energy cost environment. Part of the well-established Universal Industries Group, Glacier has 26 years' experience and are acknowledged industry leaders in refrigeration door technology. Innovative and forward-thinking, the company is built on cutting-edge technology, technical expertise and a customer-centric approach.

Air Shield Glass Doors

Features and Benefits

- Double glazed glass doors with Argon gas fill for superior insulation.
- Glass durability and clarity with torsion bar for positive closing.
- Glass door heating option for high humidity environments.
- Glass doors available with hold open brackets and LED lighting options.
- Flex modelling means glass panels are customised to fit existing cabinets and are tailored to suit each store's specific environment.

A quick and easy energy-saving retrofit solution, Air Shield Glass Doors can be fitted to any existing open refrigeration case, saving up to 40% on energy consumption.



Note: The value proposal is based on R1.31 per kWh and 40% energy saving. These are averages based on our experience and can be validated per store.

The value benefit

- High-quality locally manufactured solutions featuring the latest energy-saving technology.
- Demonstrated good pay back periods can be expected.
- Customised solutions to suit your store.
- ISO 9001 accredited factory.
- Safety toughened glass in accordance with SABS/SANS certification.
- Flexible installation timing to offset any customer disruption.
- Financing options available.

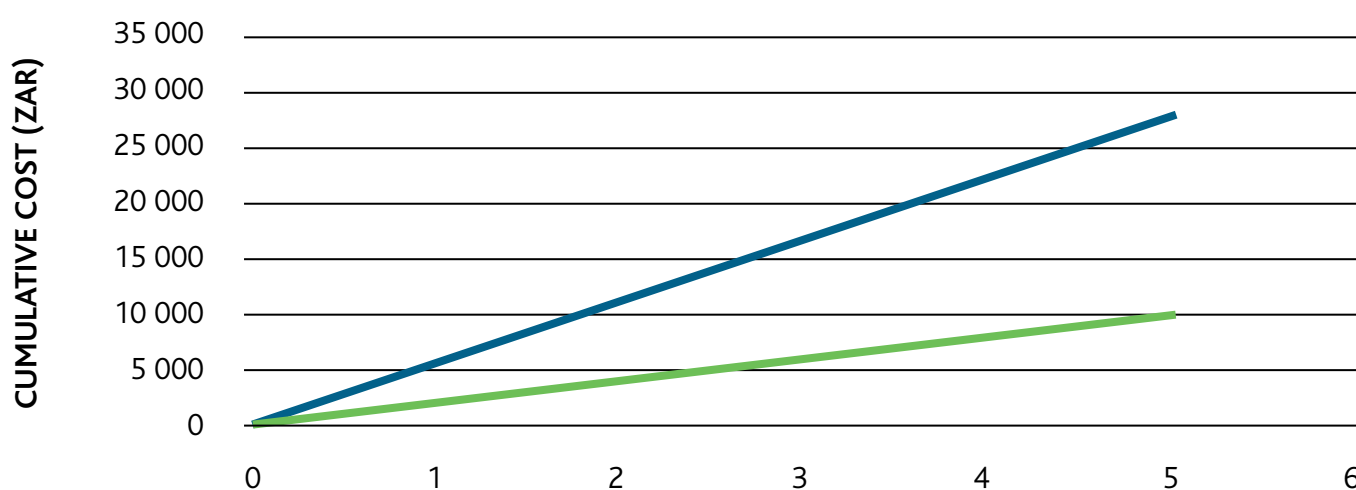
You can trust a Glacier door



Eco Leaf Freezer Doors

Designed as a 'swop-out', energy-saving replacement glass door utilising 220V technology that eliminates the need for voltage-reducing capacitors. This results in an amperage reduction from 1.29A on the standard door to 0.46A (64%) with the replacement Eco Leaf Door.

The Eco Leaf door is 64% more efficient than the standard door. The value proposal is based on R1.31 per kWh and 64% energy saving. These are averages based on our experience and can be validated per store.



	AMPS	VOLTS	WATTS
Glacier Eco Leaf Door	0,46	230	105.8
Glacier Standard Door	1,29	230	296.7